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10/727,818	12/04/2003	Timothy E. Herod	139-3	7473

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EXAMINER

DANIELS, MATTHEW J

ART UNIT PAPER NUMBER

1732

DATE MAILED: 11/30/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/727,818

Applicant(s)

HEROD ET AL.

Examiner

Matthew J. Daniels

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --  
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 04 December 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-30 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-30 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO/SB/08)  
Paper No(s)/Mail Date 12/4/03, 6/6/05.
- 4) ☐ Interview Summary (PTO-413)  
Paper No(s)/Mail Date. \_\_\_\_\_.
- 5) ☐ Notice of Informal Patent Application
- 6) ☐ Other: \_\_\_\_\_.

## DETAILED ACTION

### *Claim Rejections - 35 USC § 103*

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

1. **Claims 1, 12, 15, 17-23, 29, 30** are rejected under 35 U.S.C. 103(a) as being unpatentable over Fortin (USPN 5683648). **As to Claim 1**, Fortin teaches a method for thermoforming a thin thermoplastic carrier (9:51-52) comprising the steps of:

locating a sheet on a vented platform equipped with a mold insert and clamping the thermoformer platens (Fig. 22, item 40);

confining a low pressure air stream within a shroud having a geometry matched to the mold insert's periphery (Fig. 22, item 14); and

deflecting the air stream from a path leading directly to the mold insert (Fig. 22, orientation perpendicular to sheet).

Fortin is silent to the following aspects of the invention:

- (a) the resulting article having uniformity of thickness at optical quality
- (b) the claimed order of steps of heating and locating the sheet

However, these aspects would have been inherent or obvious for the following reasons:

- (a) The article of Fortin was optically transparent, and would thus have inherently had optical quality over portions of the article or the entire article. Alternatively, in view of its desirability

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of having transparency, it would have been prima facie obvious to improve its optical quality.

As to the uniformity, the biaxial orientation of Fortin would have inherently or obviously produced an article having a uniform or substantially uniform thickness over portions of the article or the entire article.

(b) It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to rearrange the order of heating and locating the sheet in order to provide enhanced control over the temperature of the sheet. Additionally, rearrangement of the order of process steps disclosed by the prior art is generally prima facie obvious. See MPEP 2144.04 and *Ex parte Rubin*, 128 USPQ 440 (Bd. App. 1959) (Prior art reference disclosing a process of making a laminated sheet wherein a base sheet is first coated with a metallic film and thereafter impregnated with a thermosetting material was held to render prima facie obvious claims directed to a process of making a laminated sheet by reversing the order of the prior art process steps.). See also *In re Burhans*, 154 F.2d 690, 69 USPQ 330 (CCPA 1946) (selection of any order of performing process steps is prima facie obvious in the absence of new or unexpected results).

**As to Claim 12**, Fortin teaches the claimed thickness (9:30-45), and the sheet of Fortin would have inherently been heated above its glass transition temperature in order to allow orientation (9:30-45). **As to Claim 15**, Fortin teaches a pressure less than 290 psi (10:8-16). **As to Claims 17-19**, the shroud of Fortin would have obviously had substantially the same geometric shape as the article produced and the mold insert's periphery in order to enclose and surround item 403 in Fig. 22. The shroud (Fig. 22, Item 14) of Fortin is shown to have substantially the same cross sectional shape along its height. **As to Claims 20-22**, by teaching

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cylindrical articles, it would have been prima facie obvious over Fortin's method to provide a cylindrical shroud. As to the particular size or size ratio, Fortin teaches that many different sizes and height:diameter ratios may be used (All figures). Thus, the size represents a variable that the ordinary artisan would have found it obvious to change or modify in order to achieve different container shapes. Fortin also teaches that the shroud is not disproportionately larger than the mold (Figs. 18a and 18b). **As to Claim 23**, Fortin teaches that the vent is located within the space between the radius of the insert and the radius of the shroud (Fig. 22, items 14, 404, and the hole in the bottom left corner of item 12) **As to Claim 29**, the substantially round shape of both the insert and the shroud and the desirability of a cylindrical shape would suggest that the two are concentrically arranged. **As to Claim 30**, unclamping the platens of Fortin would have been inherent, and Fortin anneals the article for about 5 minutes (18:54-59). Fortin teaches that many temperatures can be used, preferably within 75 degrees C of the melt temperature, but for PET, 120 – 250 degrees C is sufficient (14:40-60). Fortin's 120 degrees C is equivalent to 248 degrees F.

2. **Claims 2-6** are rejected under 35 U.S.C. 103(a) as being unpatentable over Fortin (USPN 5683648) in view of Niebling (USPN 5108530) and Cruckshank (USPN 3753830). Fortin teaches the subject matter of Claim 1 above under 35 USC 103(a). **As to Claim 2**, Fortin is silent to the heating medium through the vented platform and through circulating channels within a sub-platform spaced from the vented platform to form a gap therebetween which communicates with the vents. However, Niebling teaches passing a heating medium through the platform (Fig. 1, item 19), and Cruckshank teaches passing heating medium through circulating

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channels within a sub-platform (Fig. 3, item 94) spaced from the vented platform (Fig. 3, Item 86) to form a gap therebetween (Fig. 3, Item 84) which communicates with the vents (Fig. 3, item 86). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the methods of Niebling and Cruckshank into that of Fortin in order to maintain the mold temperature at the desired level and to provide more uniform heat distribution. **As to Claim 3**, Fortin clearly suggests that the sheet reach a temperature of 70 C, or 158 F (9:40-42). Although silent to the particular heating medium temperature, when combined with Niebling and Cruckshank, it would have been prima facie obvious to provide a heating medium temperature substantially the same as the desired mold temperature. **As to Claims 4 and 5**, Fortin teaches that the particular temperature to which the platform is heated and the heated air stream should be selected so as to be equal to the orientation temperature of the thermoplastic material (9:38-40 and 18:26-34). Therefore, the particular temperatures of the platform and air stream are result effective variables in order to produce the desirable orientation. **As to Claim 6**, Fortin teaches providing a mold with a base member, installing, adjusting to lie even with the platform (Fig. 22, item 404), and locking by use of the cylinder (Fig. 22, Item 400).

3. **Claim 7** is rejected under 35 U.S.C. 103(a) as being unpatentable over Fortin (USPN 5683648) in view of Cruckshank (USPN 3753830). Fortin, Niebling, and Cruckshank teach the subject matter of Claim 2 above under 35 USC 103(a). **As to Claim 7**, Fortin is silent to the claimed cooling medium, channels within the support platform, and sandwiching an insulating plate. However, Cruckshank teaches a circulating a cooling medium through channels within a

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support platform (horizontal portion of 90c in Fig. 3), and sandwiching an insulating plate (the plate above 80c and 90c). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Cruckshank into that of Fortin in order to supply coolant to the heating and cooling manifold and to support the mold.

4. **Claim 8** is rejected under 35 U.S.C. 103(a) as being unpatentable over Fortin (USPN 5683648) in view of Enlow (USPN 5686186) and Edwards (USPN 3342914). Fortin teaches the subject matter of Claim 1 above under 35 USC 103(a). **As to Claim 8**, Fortin teaches heating the sheet to at least its glass transition temperature, which would have been below its orientation temperature (9:38-45), but is silent to the removing of the protective sheet and the sled, which is interpreted to be a restraining frame. However, Enlow teaches removal of a carrier sheet before thermoforming (13:67-14:4) and Edwards teaches a restraining frame (Fig. 1, Items 14 and 16). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the methods of Enlow and Edwards into that of Fortin in order to protect the sheet until thermoforming or to use a carrier sheet to assist in fabricating the sheet to be thermoformed (Enlow) and to help avoid wrinkling by restraining the sheet (Edwards).

5. **Claim 9** is rejected under 35 U.S.C. 103(a) as being unpatentable over Fortin (USPN 5683648) in view of Enlow (USPN 5686186) and Edwards (USPN 3342914), and further in view of Dastoli (USPN 4880581). Fortin, Enlow, and Edwards teach the subject matter of Claim 8 above under 35 USC 103(a). **As to Claim 9**, Fortin is silent to the HEPA airflow environment. However, Dastoli teaches that a HEPA airflow environment is desirable for any plastic

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manufacturing process employing high temperature and pressure (6:30-42, 4:15). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Dastoli into that of Fortin in order to provide a product which is ready for shipment, which is sterile both interiorally and exteriorally (6:20-29).

6. **Claims 10 and 11** are rejected under 35 U.S.C. 103(a) as being unpatentable over Fortin (USPN 5683648) in view of Enlow (USPN 5686186), Edwards (USPN 3342914), Dastoli (USPN 4880581), and further in view of Bonkowski (USPN 5237796). Fortin, Enlow, Edwards, and Dastoli teach the subject matter of Claim 9 above under 35 USC 103(a). **As to Claims 10 and 11**, Fortin is silent to the IR heating of the sheet. However, Fortin clearly suggests the claimed temperature range (9:40-45). Additionally, Bonkowski teaches that it is known to provide an infrared source operating at 3 to 14 microns (5:35), overlapping the PET absorption bands (4:3-15) in order to heat the sheet prior to thermoforming. Fortin also suggests that the sheet be heated for a time sufficient to cause the sheet to reach the desired temperature (18:25-30). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Bonkowski into that of Fortin in order to rapidly heat the sheet using infrared energy overlapping the absorption bands of Fortin's PET material.

7. **Claims 13, 14, and 16** are rejected under 35 U.S.C. 103(a) as being unpatentable over Fortin (USPN 5683648) in view of Hall (USPN 5649438). Fortin teaches the subject matter of Claim 1 above under 35 USC 103(a). **As to Claim 13**, Fortin is silent to the clamping pressure. However, the claimed clamping pressure is a conventional clamping pressure and is taught by



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Hall (12:22-32). Furthermore, Hall teaches clamping pressure and pneumatic pressure to be result effective variables which should be optimized in order to avoid wrinkling (11:11-36). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Hall into that of Fortin in order to avoid wrinkling. **As to Claim 14**, Hall suggests the claimed process conditions be determined by optimization. Thus, one optimizing the process of Fortin would have obviously arrived at the same process conditions. Also see Hall's teaching of values for pneumatic (Fp) and clamping (Fc) in Fig. 4, which may be calculated from the graph by the presence of the y-axis hash marks. **As to Claim 16**, Hall teaches that the clamping pressure should be determined by optimization (11:11-36) and Fortin teaches that the pneumatic pressure should additionally be determined by experimentation (10:14-20), and Fortin teaches a pressure substantially similar to the claimed pressure.

8. **Claim 24** is rejected under 35 U.S.C. 103(a) as being unpatentable over Fortin (USPN 5683648) in view of Edwards (USPN 3172159). Fortin teaches the subject matter of Claim 1 above under 35 USC 103(a). **As to Claim 24**, Fortin is silent to simultaneously thermoforming multiple carriers. However, Edwards teaches that it is known to locate a heated sheet on a platform with multiple mold inserts (Figs. 2 and 3), each having a geometry-matching shroud for the insert (Fig. 5, item 156 and 216), and deflecting the air stream (Fig. 5, items 164 and 184). It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Edwards into that of Fortin because it would have been obviously desirable to shape multiple articles at once so as to improve the efficiency by increasing the scale of the process.

9. **Claims 25-27** are rejected under 35 U.S.C. 103(a) as being unpatentable over Fortin (USPN 5683648) in view of Edwards (USPN 3342914). Fortin teaches the subject matter of Claim 1 above under 35 USC 103(a). **As to Claims 25-27**, Fortin is silent to the all paths leading from the inlet to the mold insert form a cone, the deflector, and the diverter. However, Edwards teaches these aspects, namely an air stream emanating from the open inlet at the top of a cylindrical shroud, an all paths leading from the inlet to the mold insert collectively forming a cone (Fig. 13), positioning a deflector within at least part of the cone (Fig. 10, item 22b), the deflector being connected to the shroud interior (by threads, Fig. 10) and is interpreted to be a baffle, plate, or screen (Fig. 10, item 22b), wherein the air stream emanates from an inlet located at a tope of a cylindrical shroud and said deflecting step comprises deflecting the air stream with a diverter installed into the inlet. It would have been prima facie obvious to one of ordinary skill in the art at the time of the invention to incorporate the method of Edwards into that of Fortin in order to provide a more uniform blowing action (Fig. 13), over Fortin's single inlet (Fig. 17, item 260 or Fig. 22, item 22).

10. **Claim 28** is rejected under 35 U.S.C. 103(a) as being unpatentable over Fortin (USPN 5683648) in view of Cartier (USPN 5082515). Fortin teaches the subject matter of Claim 1 above under 35 USC 103(a). **As to Claim 28**, Fortin is silent to the constant radius of curvature. However, Cartier teaches that this configuration is known. Cartier teaches an insert (item 48 in Fig. 3) having a substantially consistent radius of curvature so that the formed carrier possesses a consistent radius of curvature. It would have been prima facie obvious to one of ordinary skill in

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the art at the time of the invention to incorporate the method of Cartier into that of Fortin in order to provide a pleasing rounded shape which would have many uses including skylights.

### *Conclusion*

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Matthew J. Daniels whose telephone number is (571) 272-2450.

The examiner can normally be reached on Monday - Friday, 8:00 am - 4:30 pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Christina Johnson can be reached on (571) 272-1176. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MJD 11/15/06



CHRISTINA JOHNSON  
SUPERVISORY PATENT EXAMINER

11/22/06